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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,027	11/17/2003	Laurence S. Gillick	10663-018001	5570

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EXAMINER	
ARMSTRONG, ANGELA A	

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2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/716,027	GILLICK ET AL.	
	Examiner	Art Unit	
	ANGELA A. ARMSTRONG	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the amendment filed March 21, 2008.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 21-37 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 21-37 are directed to computer program product embodied in a carrier. A signal is not a statutory class of invention under 35 U.S.C 101. Therefore, the claims fail to be limited only to embodiments which fall within a statutory class of invention.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-46 are rejected under 35 U.S.C. 102(b) as being anticipated by Riis et al, "Multilingual Text-to-Phoneme Mapping," Proceedings of the Eurospeech 2001 Conference.

4. Regarding claim 1, Riis discloses accepting text spellings (Figure 2, "text input") of training words in a plurality of sets of training words, each set corresponding to a different one of a plurality of languages (section 3, Multilingual TTP Mapping); for each of the sets of training words in the plurality, receiving pronunciations for the training words in the set, the

pronunciations being characteristic of native speakers of the language of the set, the pronunciations also being in terms of subword units at least some of which are common to two or more of the languages (Figure 3); training a single pronunciation estimator using data comprising the text spellings and the pronunciations of the training words (Figure 2, "Multilingual Recognizer"); and calculating an acoustic subword model for each subword unit, based on the pronunciations in the plurality of sets of training words, by mixing distributions of acoustic parameters from multiple languages when a subword unit is common to two or more languages (section 4.3, Multilingual acoustic module, teaches that for phonemes shared by two or more languages, the number of hidden units is equal to the number of languages sharing the phonemes.

Regarding claim 2, Riis discloses (Section 3, Multilingual TTP Mapping) accepting a plurality of sets of utterances, each set corresponding to a different one of the plurality of languages, the utterances in each set being spoken by the native speakers of the language of each set; and training a set of acoustic models for the subword units using the accepted sets of utterances and pronunciations estimated by the single pronunciation estimator from text representations of the training utterances.

Regarding claim 3, Riis discloses a first training word in a first set in the plurality corresponds to a first language and a second training word in a second set corresponds to a second language, the first and second training words having identical text spellings, the received pronunciations for the first and second training words being different (Figure 3).

Regarding claim 4, Riis discloses utterances of the first and the second training words are used to train a common subset of subword units (Figure 3).

Regarding claim 5, Riis discloses (Section 4.1, TTP Mapping) the single pronunciation estimator uses a decision tree to map letters of the text spellings to pronunciation subword units.

Regarding claim 6, Riis discloses training the single pronunciation estimator further comprises: forming, from sequences of letters of each training word's textual spelling and the corresponding grouping of subword units of the pronunciation, a letter to subword mapping for each training word (Section 4.1, TTP Mapping, 4.3, Multilingual acoustic module); and training the single pronunciation estimator using the letter-to-subword mappings (section 4).

Regarding claim 7, Riis discloses training the single pronunciation estimator and training the acoustic models is executed by a nonportable programmable device (section 4).

Regarding claim 8, Riis discloses generating, for each word in a list of words to be recognized, an acoustic word model, the generating comprising generating a grouping of subword units representing a pronunciation of the word to be recognized using the single pronunciation estimator (section 4.3).

Regarding claim 9, Riis discloses grouping of subword units is a linear sequence of subword units (section 3, Multilingual TTP Mapping to section 4.3, Multilingual acoustic module).

Regarding claim 10, Riis discloses grouping of the acoustic subword models is a linear sequence of acoustic subword models (section 4).

Regarding claim 11, Riis discloses the subword units are phonemes (section 3, Multilingual TTP Mapping to section 4.3, Multilingual acoustic module).

Regarding claim 12, Riis discloses grouping of subwords is a network, and the network represents two pronunciations of a word, the two pronunciations being representative of utterances of native speakers of two languages (section 4.3).

Regarding claim 13, Riis discloses processing an utterance; and scoring matches between the processed utterance and the acoustic word models (figure 2).

Regarding claim 14, Riis discloses generating the acoustic word model, processing the utterance, and scoring matches is executed by a portable programmable device (section 1, Introduction).

Regarding claim 15, Riis discloses the portable programmable device is a cellphone (section 1, Introduction).

Regarding claim 16, Riis discloses the utterance is spoken by a native speaker of one of the plurality of languages (figure 2; section 4).

Regarding claim 17, Riis discloses the utterance is spoken by a native speaker of a language other than the plurality of languages, the language having similar sounds and similar letter to sounds rules as a language from the plurality of languages Figure 2; section 4).

Regarding claim 18, Riis discloses a method for recognizing words spoken by native speakers of multiple languages, the method comprising: generating a set of estimated pronunciations, using a single pronunciation estimator, from text spellings of a set of acoustic training words, each pronunciation comprising a grouping of subword units, the set of acoustic training words comprising at least a first word and a second word, the first and second words having identical text spelling, the first word having a pronunciation based on utterances of native speakers of a first language, the second word having a pronunciation based on utterances of

native speakers of a second language (Figure 2; Figure 3; section 3, Multilingual TTP continuing to section 4.3, Multilingual acoustic module); mapping sequences of sound associated with utterances of each of the acoustic training words against the estimated pronunciation associated with each of the acoustic training words (Figure 2; Figure 3; section 3, Multilingual TTP continuing to section 4.3, Multilingual acoustic module); using the mapping of sequences of sound to estimated pronunciations to generate acoustic subword models for the subword units in the grouping of subwords, the acoustic subword model comprising a sound model and a subword unit (Figure 2; Figure 3; section 3, Multilingual TTP continuing to section 4.3, Multilingual acoustic module); and calculating an acoustic subword model for each subword unit, based on the pronunciations in the plurality of sets of training words, by mixing distributions of acoustic parameters from multiple languages when a subword unit is common to two or more languages (section 4.3, Multilingual acoustic module, teaches that for phonemes shared by two or more languages, the number of hidden units is equal to the number of languages sharing the phonemes.

Regarding claim 19, Riis discloses a method for multilingual speech recognition comprising: accepting a recognition vocabulary that includes words from multiple languages (Figure 2; Figure 3; section 3, Multilingual TTP continuing to section 4.3, Multilingual acoustic module); determining a pronunciation of each of the words in the recognition vocabulary using a pronunciation estimator that is common to the multiple languages (Figure 2; Figure 3; section 3, Multilingual TTP continuing to section 4.3, Multilingual acoustic module); and configuring a speech recognizer using the determined pronunciations of the words in the recognition vocabulary (Figure 2; Figure 3; section 3, Multilingual TTP continuing to section 4.3, Multilingual acoustic module); and calculating an acoustic subword model for each subword

unit, based on the pronunciations in the plurality of sets of training words, by mixing distributions of acoustic parameters from multiple languages when a subword unit is common to two or more languages (section 4.3, Multilingual acoustic module, teaches that for phonemes shared by two or more languages, the number of hidden units is equal to the number of languages sharing the phonemes.

Regarding claim 20, Riis discloses accepting a training vocabulary that comprises words from multiple languages (Figure 2; Figure 3; section 3, Multilingual TTP continuing to section 4.3, Multilingual acoustic module); determining a pronunciation of each of the words in the training vocabulary using the pronunciation estimator that is common to the multiple languages (Figure 2; Figure 3; section 3, Multilingual TTP continuing to section 4.3, Multilingual acoustic module); configuring the speech recognizer using parameters estimated using the determined pronunciations of the words in the training vocabulary; and recognizing utterances using the configured speech recognizer (Figure 2; Figure 3; section 3, Multilingual TTP continuing to section 4.3, Multilingual acoustic module).

Regarding claims 21-46, the computer implementation of Riis multilingual system provides support for a computer program product and apparatus for realizing the multilingual speech recognition acoustic models. The claim limitations recited in 21-46 to cause the processing of multilingual speech recognition are similar in scope and content to the method claims of 1-20, and are therefore rejected under similar rationale.

Response to Arguments

Applicant's arguments with respect to claims 1-46 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANGELA A. ARMSTRONG whose telephone number is (571)272-7598. The examiner can normally be reached on Monday-Thursday 11:30-8:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick N. Edouard can be reached on 571-272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Angela A Armstrong/
Primary Examiner, Art Unit 2626